

# **2019 Annual Reports**

**State Government Energy Committee Meeting  
January 6<sup>th</sup>, 2020**

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# Overview

- **2019 Annual Energy Report**
  - Buildings
  - Fleets
- **2019 Energy Conservation Plan Report**

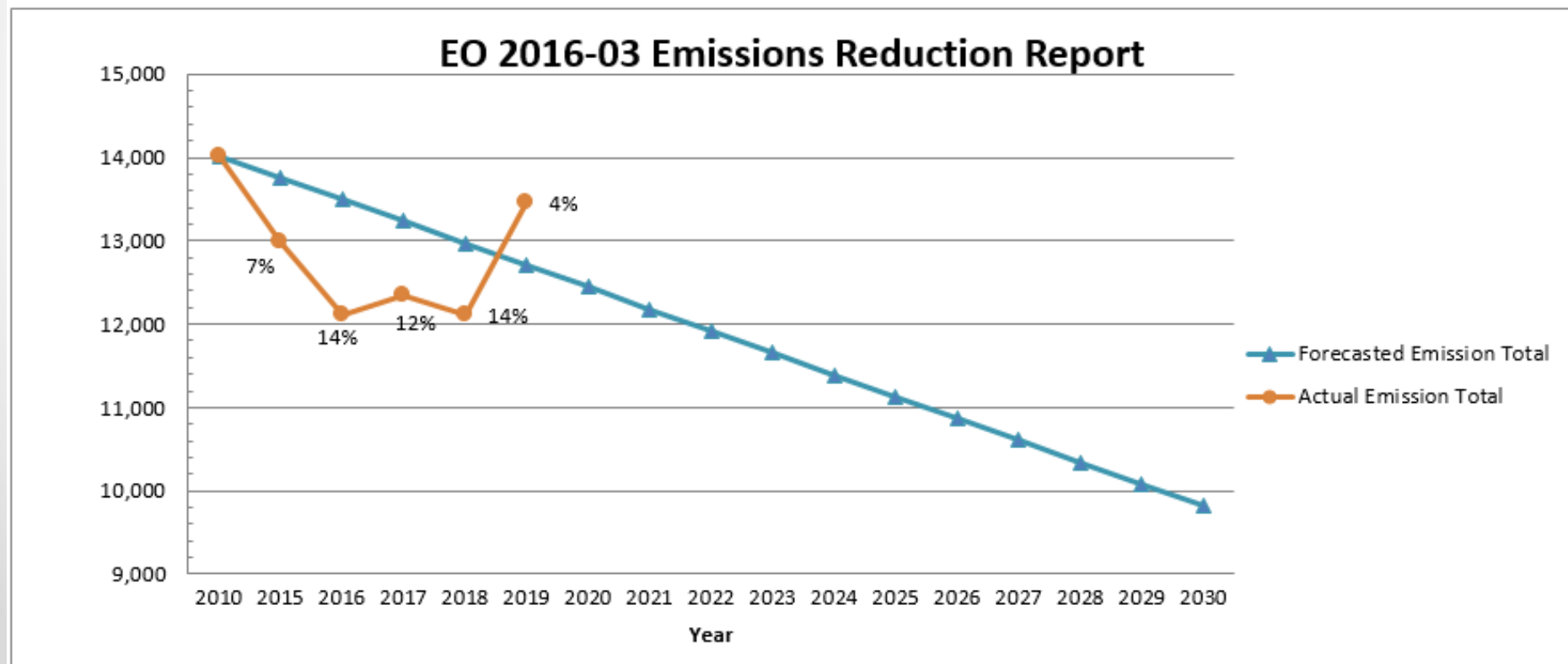
# Annual Energy Report Summary

- Fleet Report by Vehicle Type
- Total Building Energy Consumption & Costs
- Summary of State of NH Energy Consumption (FY05 & FY19)
- Weather Impacts of Building Energy Use
- Gathering Better Data

# Fleet Emissions Reduction

Year	Metric Tons of CO2					
	LDT	PassAUTO	Total	Forecasted Emission Total	Actual Emission Total	% Total Reduction
2010	7,844	6,178	14,022	14,022	14,022	
2015	7,617	5,361	12,978	13,759	12,978	7%
2016	6,985	5,130	12,115	13,496	12,115	14%
2017	7,500	4,841	12,341	13,233	12,341	12%
2018	6,798	5,313	12,111	12,970	12,111	14%
2019	8,198	5,258	13,456	12,707	13,456	4%

## State of New Hampshire



# FY2019 Fleet Annual Energy Report

*Compared to FY2010 Baseline*

Vehicle Type	Counts		Miles		Gallons		MPG		MT CO2	
	2010	2019	2010	2019	2010	2019	2010	2019	2010	2019
State Totals	2,612	2,484	29,703,740	28,701,497	2,671,952	2,755,024	11.12	10.42	23,396	24,390

Total change in Miles 1,002,243

-83,072 Total change in fuel gallons

Vehicle Type	Counts		Miles		Gallons		MPG		MT CO2	
	2010	2019	2010	2019	2010	2019	2010	2019	2010	2019
Passenger Automobiles	1,082	826	14,336,129	12,146,300	770,310	655,578	18.61	18.53	6,178	5,258
Light Duty Trucks	953	1063	13,708,963	14,572,167	978,109	1,022,225	14.02	14.26	7,844	8,198
Light Fleet Totals	2,035	1,889	28,045,092	26,718,467	1,748,419	1,677,803	16.04	15.92	14,022	13,456

Light Fleet total change (miles driven) 1,326,625

Light Fleet total % change (miles driven) 4.73%

Light Fleet total change (gallons used) 70,616

Light Fleet total % change (gallons used) 4.04%

# Moving Fleet Forward



## ezEV Vehicle Assessment

Fleet Summary Cohort/Dept. Sort By EV Suitability

\*\*\*\*\* | 2010 Ford Fusion | Plate: \*\*\*\*\*

Dept: \*\*\*\*\* DIVISION | Equip Group: Light Duty

Miles/Year: 8444 | Cost/Mile: \$0.66 --> \$0.55 EV Cost/Mile  
OPERATIONAL SAVINGS: \$13,136 NET SAVINGS: \$2,534

### Current Ops Metrics



54  
Gals



1333  
Lbs  
GHG



516  
kWh

### EV Comparison Metrics



658  
Lbs  
GHG



51%  
GHG  
Reduction



57%  
Fuel Cost  
Reduction



EV  
Suitability

## ezEV Suitability Scoring



### Recommended Vehicle: 2018 Chevrolet Bolt



In a Chevrolet Bolt (est. 53 kWh usable), we estimate that on 93 percent of the days which this vehicle sees use midday charging would not be needed. For the period under which this vehicle has been measured, midday charging would have been needed on 2 days.

\*\*\*\*\* | 2011 Dodge Grand Caravan | Plate: \*\*\*\*\*

Dept: \*\*\*\*\* DIVISION | Equip Group: Light Duty

Miles/Year: 6880 | Cost/Mile: \$0.78 --> \$0.58 EV Cost/Mile  
OPERATIONAL SAVINGS: \$12,279 NET SAVINGS: \$6239

### Current Ops Metrics



60  
Gals



1471  
Lbs  
GHG



394  
kWh

### EV Comparison Metrics



502  
Lbs  
GHG



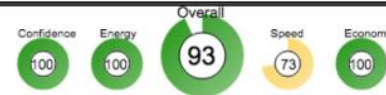
66%  
GHG  
Reduction



70%  
Fuel Cost  
Reduction



EV  
Suitability



### Recommended Vehicle: 2018 Nissan Leaf



In a Nissan Leaf (est. 36.5 kWh usable), we estimate that on 100 percent of the days which this vehicle sees use midday charging would not be needed. For the period under which this vehicle has been measured, midday charging would not have been needed.

\*\*\*\*\* | 2011 Dodge Grand Caravan | Plate: \*\*\*\*\*

Dept: \*\*\*\*\* OPERATIONS | Equip Group: Light Duty

Miles/Year: 1205 | Cost/Mile: \$3.83 --> \$NA EV Cost/Mile  
OPERATIONAL SAVINGS: \$7,588 NET SAVINGS: \$-4,452

### Current Ops Metrics



17  
Gals



410  
Lbs  
GHG



80  
kWh

### EV Comparison Metrics



102  
Lbs  
GHG



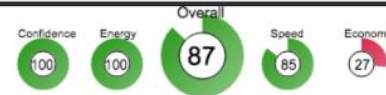
75%  
GHG  
Reduction



78%  
Fuel Cost  
Reduction



EV  
Suitability



### Recommended Vehicle: Optimization Candidate

While this vehicle's role is suited to an EV, it does not travel enough miles per year to generate operational savings, and may be considered a candidate for consolidation with other fleet vehicles in its geography.

# 2019 Energy Conservation Plan

## Summary of Completed Projects

**15** of 16 Departments submitted energy conservation plans that calculate energy savings for **68** energy efficiency projects.

Total cost: **\$1.7 million**

Energy cost savings: **\$255,000** annually

Simple payback: **7** years



# Energy Conservation Plan

## Summary of Efficiency Funding

**\$500,000** in capital funds for energy conservation projects for the fiscal biennium 2018/2019.

**30** projects across 15 agencies

- Estimated **\$122,000** annual avoided energy costs
- **4.1** year Return On Investment
- **\$1.8 Million** in lifetime avoided energy costs





# Energy Conservation Plan

## Summary of ESPC

- In FY 2019, two Energy Saving Performance Contracts (ESPC) underway.
  - Concord/State Office Park South: Twenty-eight (28) buildings located in downtown.
  - Seacoast region: 21 buildings, 5 Agencies



# Energy Conservation Plan

## Summary of Agency Priorities

- **Top priority EE projects for FY20/21 for agencies:**
  - Replace HVAC systems and controls
  - Upgrade lighting to LED (interior and exterior lighting)
  - Replace windows/doors
  - Solar P.V. systems
  - Circulation pump upgrades
  - Building envelope (air sealing/insulation)

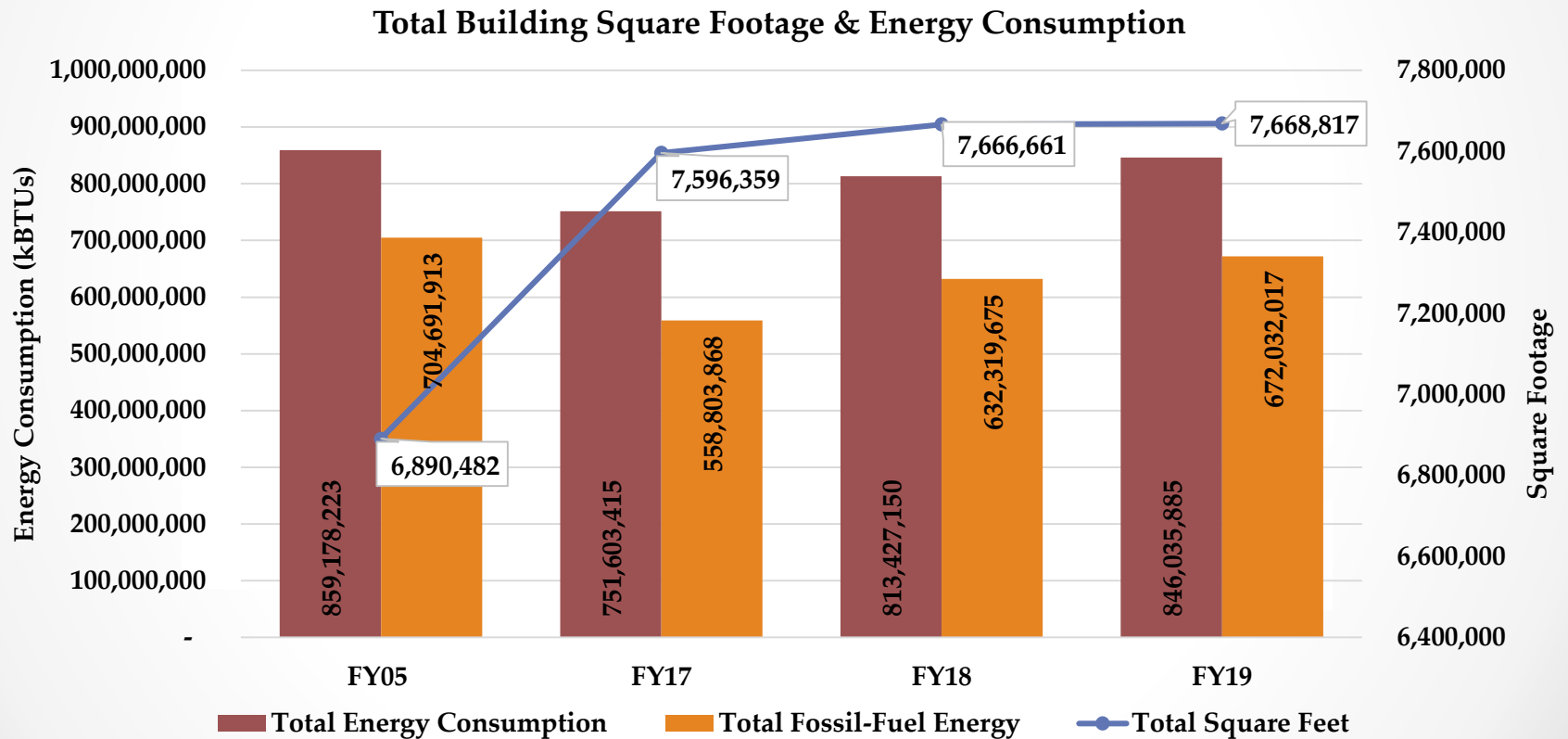


**Estimated cost for prioritized measures: \$28M**

**Return on investment: 9.2 years**

# Building Energy Consumption

## State of New Hampshire's Energy Use Overview

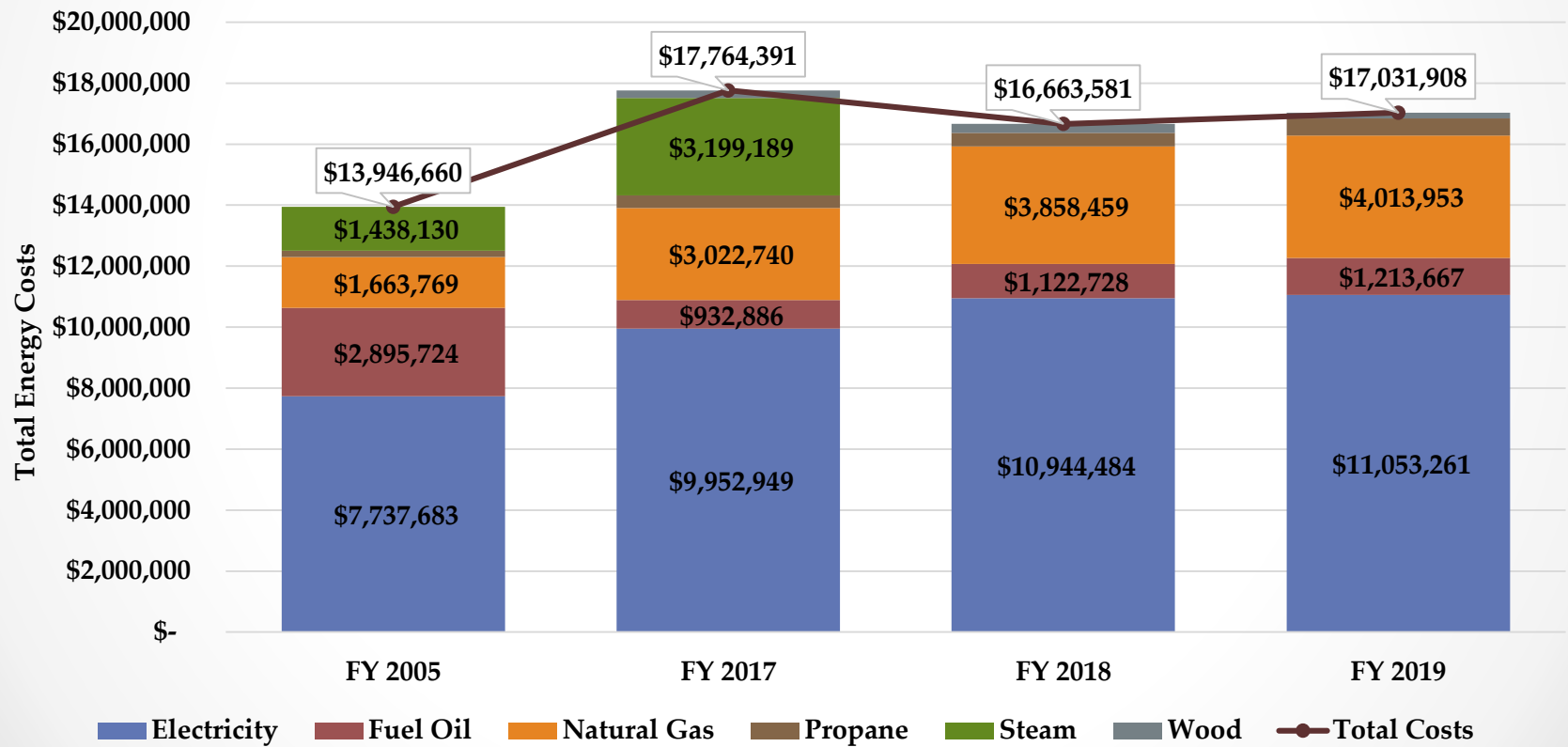


Since FY2005, the State has avoided over \$47 million in fossil-fuel energy costs.

# Building Energy Consumption

## State of New Hampshire's Energy Costs Overview

Total State Energy Costs by Fuel Source



# Building Energy Consumption

## State of NH Energy Consumption (FY05 & FY19)

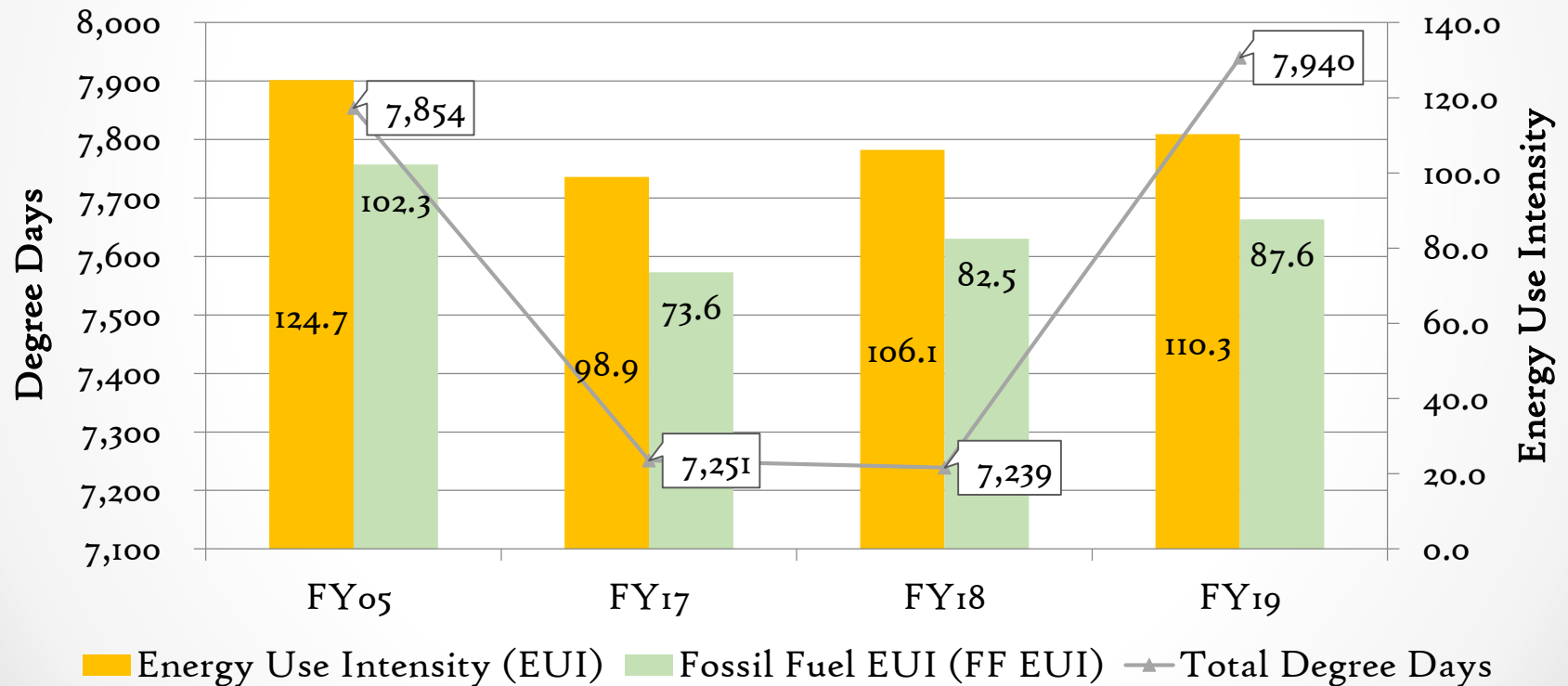
### Summary

	Total Square Feet	Total kBtus Used	Fossil-Fuel kBtus Used	Total Cost	Cost Use	EUI	FF EUI
					(\$ per sq. ft.)	(kBtus per sq. ft.)	(fossil fuel kBtus per sq. ft.)
FY05	6,890,482	859,178,223	704,691,913	\$13,946,660	\$ 2.02	124.7	102.3
FY19	7,668,817	846,035,885	672,032,017	\$ 17,031,908	\$ 2.22	110.3	87.6
% Change	11.3%	-1.5%	-4.6%	22.1%	9.7%	-11.5%	-14.3%

# Building Energy Consumption

## Weather Impacts of Building Energy Use

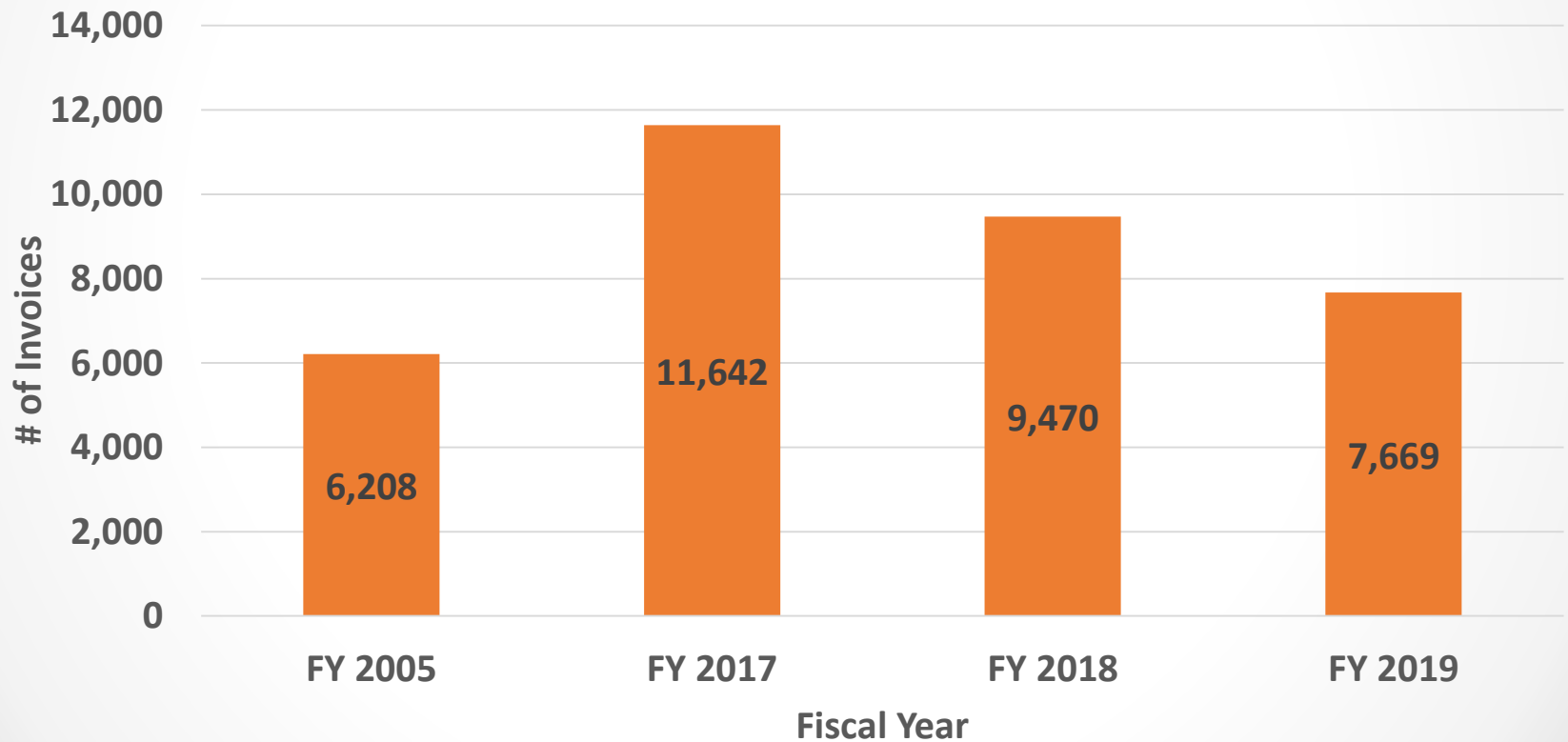
Degree Days vs. Energy Use Intensity



# Building Energy Consumption

## Gathering Better Data

Total # of Electrical Invoices



# Questions?